NOTES ON INDIAN SPECIES OF *LUDWIGIA*

The two Linnean genera, *Ludwigia* and *Jussiaea* have been traditionally treated as distinct: the former with stamens as many as the petals and the latter with stamens twice as many. In Indian floras two species have been referred to *Ludwigia* and six to *Jussiaea.* Brenan (1953) has shown that due to the reticulate relationship between plants of these two genera, they are better treated as belonging to a single genus for which he used the name *Jussiaea.* Hara (1953) has pointed out that these genera had first been merged by Baillon (Hist. Pl. 6: 463, 1877) under *Ludwigia* and according to the *Int. Code Bot. Nom.,* Baillon's choice should be followed. Raven (1963) follows Hara's example in his revision of the Old World species of *Ludwigia.*

KEY TO THE INDIAN SPECIES OF *LUDWIGIA*

1. Stamens twice as many as the petals :
    2. Seeds free, not embedded in endocarp, pluriseriate; pollen shed in tetrads :
        3. Raphe equal in diameter to the body of the seed ; capsule thin-walled, terete, pale brown with 6 dark ribs *L. octovalvis*
        3. Raphe not more than ¼ the diameter of the body of the seed ; capsule strongly 4-angled with 4 nearly flat sides . . *L. peruviana*
    2. Seeds embedded in endocarp, uniseriate at least below ; pollen shed individually :
        4. Seeds dimorphic, pluriseriate and free in the upper ¼ of the capsule, uniseriate in lower part ; erect marshy plants with elongate pneumatophores arising from burried roots . . *L. hyssopifolia*
        4. Seeds not dimorphic, all uniseriate, firmly embedded in woody coherent endocarp ; aquatic or marshy plants, rooting at the nodes, with conspicuous white erect spindle-shaped pneumatophores arising in clusters at the nodes of floating stems and roots . . . *L. adscendens*
1. Stamens as many as the petals, very rarely (in *L. perennis*) more in some flowers :
    5. Seeds pluriseriate in each locule of the capsule . . . . *L. perennis*
    5. Seeds uniseriate in each locule of the capsule, showing plainly as indendations in the walls at maturity . . . *L. prostrata*

Ludwigia octovalvis (Jacq.) Raven in Kew Bull. 15: 476, 1962 & in Reinwardtia 6: 356, 1963. *Oenothera octovalvis* Jacq. Enum. Syst. Pl. 19, 1760. *Jussiaea suffruticosa* Linn. Sp. Pl. 1: 388, 1753; Clarke in Fl. Brit. Ind. 2: 587, 1879.

Raven recognises three subspecies in the Old World, two of which occur in India.

Pubescence of long erect hairs ; leaves often subovate . . subsp. *sessiliflora*
Pubescence appressed or largely wanting ; leaves lanceolate or linear . subsp. *octovalvis*

Several intermediate forms have been observed among the collections in MH. Raven himself writes: "I have divided the rest of the specimens into subsp. *sessiliflora,* with spreading pubescence and ovate or subovate leaves ; and subsp. *octovalvis,* with appressed pubescence or subglabrous and lanceolate leaves. Numerous intermediates between the two extremes exist, but in their typical forms they are sharply distinct." Since plants of this species are highly variable (Santapau, Rec. bot. Surv. India 16(1): 90, 1958) it is better to treat the Indian materials of this species under the single subspecies *octovalvis.*

L. peruviana (Linn.) Hara in J. Jap. Bot. 28:293, 1953; Raven in Reinwardtia 6: 345, 1963. *Jussiaea peruviana* Linn. Sp. Pl. 1: 388, 1753. *J. speciosa* Ridley in J. Bot. (Lond.) 59: 259, 1921; Fischer in Gamble, Fl. Pres. Madr. 1298, 1957 (Repr. ed.).

The lectotype of *Jussiaea speciosa* Ridley is a specimen collected by Gamble in 1886 from Devala, Nilgiris, and now kept in the British Museum (Raven). A duplicate of this lectotype specimen (*Gamble* 18361) is available in MH under the accession number 22084.

L. hyssopifolia (G. Don) Exell in Garcia de Orta 5: 471, 1957; Raven in Reinwardtia 6: 385, 1963. [*Jussiaea hyssopifolia* G. Don, Gen. Syst. 2: 693, 1832. *J. fissendocarpa* Haines in J. As. Soc. Bengal n.s. 15: 313, 1820 & Bot. Bih. Or. 399, 1961 (Repr. ed.). *J. linifolia* Vahl, Eclog. Am. 2: 32, 1798 non *L. linifolia* Poir. 1813; Fischer in Gamble, Fl. Pres. Madr. 1298, 1957 (Repr. ed.)]

This is a widespread pantropical weed with an unusual occurrence of dimorphic seeds. It has often been confused with *L. parviflora* (Raven 379) and *L. prostrata.* Forty of the forty-two Herbarium sheets in the Southern Circle Herbarium of the Botanical Survey of India (MH) kept under the name *L. prostrata,* on careful examination, turned out to be *L. hyssopifolia.*

L. adscendens (Linn.) Hara in J. Jap. Bot. 28: 291, 1953; Raven in Reinwardtia 6:387, 1963. *Jussiaea adscendens* Linn. Mant. 1:69, 1767. *J. repens Linn.* Sp. Pl. 1: 388, 1753 non *Ludwigia repens* Forster 1771; Clarke in Fl. Brit. Ind. 2: 587, 1879.

This is a common water plant occurring throughout India in fresh water lakes and ponds. Examination of Indian materials in the MH shows some specimens with pedicels much shorter than usual. Some of the specimens have pedicels as short as 1.7 cm. whereas Raven reports the length of the pedicels as 2.5-5.5 cm.

Ludwigia perennis Linn. Sp. Pl. 1:119, 1753 (excl. *"foliis oppositis"*); Raven in Reinwardtia 6: 367, 1963. *L. parviflora* Roxb. [Hort. Beng. 11, 1814 *nomen*] Fl. Ind. 1: 440, 1820; Clarke in Fl. Brit. Ind. 2: 588, 1879.

McCann (J. Bombay nat. Hist. Soc. 50: 956, 1952) reported that flowers of this species have 8 stamens in bud of which 4 are caducous. I have examined over fifty unopened flower buds from two localities, one in Madras and the other in Kerala. I could not find even a single flower having more than 4 stamens. I fully agree with Raven in his assumption that McCann was probably dealing with *L. hyssopifoila* which is very common in India and which has 4 long persistent and 4 short easily caducous stamens. Raven reports two specimens of *L. perennis* with supernumerary stamens from the Paris Herbarium. It is my opinion that such cases are exceedingly rare.

L. prostrata Roxb. (Hort. Beng. 11, 1814 *nomen*) Fl. Ind. 1: 441, 1820; Clarke in Fl. Brit. Ind. 2: 588, 1879.

This plant is often confused with *L. hyssopifolia* as already stated. However, these two species can be easily separated using the key given above. This species appears to be rare in South India as it is represented by a single collection made by Beddome from Anamalais in 1867.

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HARA, H. *Ludwigia* versus *Jussiaea*. *J. Jap. Bot.* 28 : 289-294, 1953.

RAVEN, P. H. The Old World species of *Ludwigia* (Including *Jussiaea*), with a synopsis of the genus (Onagraceae). *Reinwardtia* 6 : 327-427, 1963.

SOME ADDITIONS TO THE FLORA OF THE PRESIDENCY OF MADRAS—II

Sebastine (1962) brought together the scattered information on the new taxa described by various botanists in different journals and periodicals, since the publication of the 'Flora of the Presidency of Madras' by Gamble (1936) with a view to facilitate the revision of the above mentioned Flora and to provide useful information to various research workers and students of Botany. Balakrishnan (1964) published new plant records from South India not previously reported from the area coming under the 'Flora of the Presidency of Madras'. The present paper deals with an additional list of plants collected and recorded from the area and which are not included in the previous lists.

The names of plants are arranged in alphabetical sequence. Every name is followed by a reference to the original publication as well as other publications in which they are recorded. Literature citations are made as usual, except for the following abbreviations which are used for the sake of convenience:

BBSI	Bulletin of the Botanical Survey of India
BL	Blumea
COOKE	Theodore Cooke—'The Fora of the Presidency of Bombay' 1958 (reprinted edition)
CS	Current Science
FBI	J. D. Hooker *et al*—'Flora of British India' 1872-1879
HAINES	H. H. Haines—'The Botany of Bihar and Orissa' 1921-25
JBNHS	Journal of the Bombay Natural History Society
JIBS	Journal of the Indian Botanical Society
JSIR	Journal of Scientific and Industrial Research
KB	Bulletin of Miscellaneous Information, Kew
NLB	N. L. Bor—'The Grasses of Burma, Ceylon, India and Pakistan' 1960
RBSI	Records of the Botanical Survey of India

LIST OF TAXA

Amorphophallus commutatus Engl. (ARACEAE)—KB: 36, 1938; FBI 6: 515; COOKE 3: 1133.

Andropogon polyptychus Steud. var. **deccanensis** Bor (GRAMINEAE)—NLB: 91, 1960.

Arthrocloa henrardiana (Bor) Lorch (GRAMINEAE)—JIBS 89: 490, 1960.

Arundinella purpurea Hochst. ex Steud. var. **laxa** Bor (GRAMINEAE)—KB:407, 1955; NLB:424, 1960.

A. setosa Trin var. **esetosa** Bor (GRAMINEAE)—NLB: 425, 1960.